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(54) Method of folding a lining for a container

Verfahren zum Falten einer Innenauskleidung für einen Behälter

Procédé de pliage d'un doublure pour un emballage

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Description

The invention relates to a method of folding a lining for a block-shaped container, which lining is made of flexible material and can be placed folded in the container, and can then brought to the desired shape in the container through filling. Such linings, which are known from EP-A-326730, are generally used when a liquid or a powdered material has to be packed in a container which itself is not completely tight. The lining provides the desired barrier properties (tightness), while the container supplies the desired strength for supporting the packed material. Such containers can be many different sizes, for example their capacity can be 1 cubic metre or a number of cubic metres.

The known lining comprises at least two identical sheets, with the filling aperture in one sheet, and a shut-off valve/tap holder in the other sheet. During its fitting, the lining is folded together in such a way that it can be placed flat on the bottom of the container. During the subsequent filling of the lining, the top surface rises up, and the wall must gradually unfold in the vertical direction.

This known lining and the method of filling thereof give rise to problems. The internal pressure occurring during the filling, however small it may be, causes the unfolding wall to be pressed against the container. This produces friction, which increases as the internal excess pressure increases during the filling. The result of all this can be that the lining is not unfolded completely, and that folds remain in the side wall of the container. Such folds give rise to tension concentrations in the lining material, which can lead to leakage. When filled, the lining can easily tear or become porous at those folded places, with the result that the contents can leak out. In practice, the filling of such linings must also be carried out with great care, which means that the filling has to be carried out by experienced personnel.

The object of the invention is to provide a method of folding a lining which can be filled without problems in a block-shaped container. This object is achieved by correspondingly folding a lining of flexible plastics material into an elongate strip having a width which is substantially smaller than the width of a side wall panel of a block-shaped container, of placing said folded lining against a side wall panel of said container to extend in its lengthwise direction at least between the top and the bottom wall of said container, and of unfolding said folded lining in directions towards both the adjacent side wall panels and the opposite side wall panel of the container.

According to a preferred embodiment, the strip obtained after folding the lining continues beyond the top edge of the side wall panel (13) as well as over the bottom wall with a piece of which the size, in the lengthwise direction of the strip, corresponds essentially to half the length of the bottom wall, in such a way that when folded up the strip can be placed over the entire length of said side wall panel of the container and over half the length of the bottom wall adjacent thereto.

The unfolding of the lining now takes place in the crosswise direction. If the folded-up or rolled-up lining is fixed in the centre of one of the side walls of the block-shaped container, a more or less symmetrical unfolding of the lining is obtained. During this, the unfolding lining is virtually unimpeded by the walls of the container, with the result that fold formation can largely be avoided. It also means that there is no need for the personnel handling the filling of the lining to check it constantly, with the result that processing is considerably facilitated.

The lining is preferably made up of at least two identical rectangular or square pieces of flexible sheet material which are welded to each other at the edges, one sheet being provided with a fixing means. One element of said fixing means is intended for fixing the strip at or near the bottom wall, which fixing means is an emptying outlet.

As already mentioned, the lining is placed in the container folded up or rolled up. It can be folded up in different ways here, these being determined by the position of the fixing means. According to a preferred embodiment, in which the pieces of sheet material are divided into at least two equal square halves by a bisecting line, the four corner parts of the halves are each folded towards the centre of the pieces, and the parts lying to the sides of the bisecting line are folded over or rolled up one or more times, in such a way that the lining forms a strip made up of several layers lying on top of one another.

During the filling of a lining folded up in this way, said lining unfolds symmetrically relative to the connecting line between the two fixing points.

The invention also relates to a method comprising the step of providing a transport pack in which the lining can be placed, which transport pack comprises a number of panels which in the collapsed position enclose the lining and in the opened-out position can cover a number of walls and the bottom of the container. The transport pack protects the fragile lining from damage during storage and transportation. For the rest, the lining can simply be placed with it in the container, with the tap lowered in the correct position in the bottom of the container. The dimensions of the panels of the transport pack are in fact selected in such a way that it fits precisely inside the container and holds the lining ready in the desired position, in such a way that it can be filled by two simple actions.

The transport pack preferably comprises a central panel, the dimensions of which correspond to the bottom of the container, and also side panels which are provided at two opposite edges of the bottom, and the dimensions of which correspond to those of two opposite walls of the container, in such a way that the side panels can be opened out on said walls when the central panel is placed on the bottom. The lining is fixed to the central bottom panel. After the side panel concerned has been opened out, the lining must be placed in the folded state against the adjoining panel of the container and along the panel of the transport pack, using a tool developed

for the purpose. The lining then lies in the correct position for filling.

The side panels of the transport pack can also be provided at both sides with auxiliary panels which can be opened out on the other two walls of the container. All the walls of the container, apart from the lid, can thus be covered by the panels of the transport pack. A further protection of the lining is also obtained in this way, which is important if the internal surfaces of the container walls have irregularities.

The invention will be explained in greater detail below with reference to an example of an embodiment shown in the figures.

Figure 1 shows a lining according to the invention in a first stage of folding up.

Figure 2 shows the lining according to Figure 1 in a second stage of rolling up.

Figure 3 shows the completely folded-up and rolled-up lining in the partially opened-out transport pack.

Figure 4 shows the still folded-up and rolled-up lining in the completely opened-out transport pack.

Figures 5a, 5b and 5c show the successive inflation or filling stages of the lining in a container shown by dashed lines.

The partially folded lining 1 shown in Figure 1 comprises two pieces of flexible material 2, 3 which are fixed to each other at their edges. The filling aperture 4 and the emptying aperture 5 are disposed in the piece of flexible material which is uppermost in Figure 1.

In the stage of folding of the lining 1 shown, two corner parts 6 of the lining 1 are folded over towards the centre, thus leaving a strip 7 clear between them. When the other corner parts 6 of the lining 1 are folded over towards the centre, corresponding strips 7, in which the filling aperture 4 and the emptying aperture 5 are situated, remain clear.

Figure 2 shows that the lining is then rolled up. In the left half of Figure 2 the lining is already completely rolled up, while in the right half the lining has to be rolled up further.

In the completely folded-up and rolled-up state the lining 1 is then placed in the transport pack 10 shown in Figure 3. The filling aperture 4 can still be seen in Figure 3. The emptying aperture 5 is situated in the part of the lining 1 which is folded over through 180° and faces the central panel 11 of the transport pack 10. This central panel 11 is provided with a hole (not visible in Figure 3), through which a connecting piece 12 provided around the emptying aperture 5 is inserted.

The transport pack has two side panels 13, 14, which are in turn each provided with auxiliary panels 15, 16. The central panel 11 also has two auxiliary panels 17. Figure 4 shows the transport pack 10 in the fully opened-out state. In this state it is lying in the container, but the latter is left out of Figure 4, for the sake of clarity. The central panel 11 of the transport pack 10 is situated on the bottom of the container (not shown), while the side panels 13 and 14 are opened up against two opposite container walls. The auxiliary panels 15 and 16 are then

opened out, following which the auxiliary panels 17, fixed to the central panel 11, are opened out against the inside of said panels. The folded-up lining 1 can now be placed in the correct position, in which case the position of the emptying aperture 5 can also be seen.

The filling aperture 4 and the connecting piece 18 situated thereon must be retained at the top edge of the container wall in question, which is shown in further detail in Figure 5.

Figure 5 shows the lining 1, as fitted in the container. The container is shown by dashed lines, for the sake of clarity. For the rest, the transport pack 10 is not shown in any further detail.

The connecting piece 18 of the lining 1 is suspended by means of a bracket 19 from the top edge of the container wall, not shown in any further detail, while the emptying connecting piece 12 projects out through a corresponding aperture in said container wall or the bottom of the container. Figure 5a shows the filling hose 20, which is connected to connecting piece 18.

During the introduction of filling material the lining unfolds to both sides, from the bottom (see Figure 5b). Since the lining 1 can unfold freely, no fold formation occurs, with the result that the interior of the container can be filled.

Figure 5c shows the lining completely full. It is still inside the container, which for the rest is not shown. It can be seen clearly in this figure that the lining 1 is made up of the two pieces of sheet material 2, 3 fixed together by welding seam 23, the filling aperture 4 and the emptying aperture 5 being situated in the piece 2.

When filled, the lining 1 has at its top side two flaps 21, 22, which can be folded flat on the top side of the filled lining.

After emptying of the lining 1, the flexible sheet material can be folded up or crumpled up again in a simple manner, in such a way that the various panels of the transport pack 10 can be folded onto each other again. The used lining 1 can be transported again in its transport pack 10, or thrown away.

Claims

1. Method of folding a lining of flexible plastics material into an elongate strip having a width which is substantially smaller than the width of a side wall panel of a block-shaped container, of placing said folded lining against a side wall panel of said container to extend in its lengthwise direction at least between the top and the bottom wall of said container, and of unfolding said folded lining in directions towards both the adjacent side wall panels and the opposite side wall panel of the container.
2. Method according to claim 1, in which the strip continues beyond the top edge of the side wall panel (13) as well as over the bottom wall with a piece of which the size, in the lengthwise direction of the strip, corresponds essentially to half the length of the bot-

tom wall, in such a way that when folded the strip can be placed over the entire length of said side wall panel (13) of the container and over half the length of the bottom wall adjacent thereto.

3. Method according to Claim 2, in which the lining (1) is made of at least two identical rectangular or square pieces (2, 3) of flexible sheet material which are welded to each other at their peripheral edges (23), one sheet being provided with a fixing means for positioning the lining with respect to the container. 5
4. Method according to Claim 3, in which the fixing means point is positioned with respect to the bottom wall of the container, said fixing means being an emptying outlet (5) of the liner. 10
5. Method according to Claim 4, in which the pieces of sheet material are divided into at least two equal square halves by a bisecting line, the four corner parts (6) of the halves are each folded towards the centre of the pieces, and the parts lying to the sides of the bisecting line are folded over or rolled up one or more times, in such a way that the lining forms a strip made up of several layers lying on top of one another. 15
6. Method according to Claim 5, in which the four corner parts (6) are folded over or rolled up, leaving clear at least a narrow space (7) between them, in which space the fixing means lies. 20
7. Method according to one of the preceding claims, comprising the step of providing a pack in which the lining is accommodated, said pack comprising a number of panels (11, 13-17) which in the collapsed position enclose the lining (1), and in the opened-out position cover a number of walls and the bottom of the container. 25
8. Method according to Claim 7, in which the pack comprises a central panel (11), the dimensions of which correspond to the bottom of the container, and side panels (13, 14) which are provided at two opposite edges of the bottom, and the dimensions of which correspond to those of two opposite walls of the container, in such a way that the side panels (13, 14) can be opened out on said walls when the central panel (11) is placed on the bottom, and the lining (1) is fixed to one of the side panels. 30
9. Method according to Claim 8, in which the side panels (13, 14) of the pack have at both sides auxiliary panels (15, 16) which can be opened out on the other two walls of the container. 35

Patentansprüche

1. Verfahren zum Falten einer Auskleidung aus flexiblem Kunststoff zu einem länglichen Streifen, der eine Breite aufweist, die wesentlich kleiner ist als die Breite einer Seitenwandplatte eines blockförmigen Behälters, zum Ansetzen der genannten, gefalteten Auskleidung gegen eine Seitenwandplatte des genannten Behälters, so daß sie sich in dessen Längsrichtung mindestens zwischen der Ober- und Unterwand des genannten Behälters erstreckt, und zum Auseinanderfalten der genannten, gefalteten Auskleidung in Richtungen zu beiden, benachbarten Seitenwandplatten und der gegenüberliegenden Seitenwandplatte des Behälters hin. 40
2. Verfahren nach Anspruch 1, worin der Streifen über die Oberkante der Seitenwandplatte (13) sowie auch über die Unterwand mit einem Stück hinausläuft, dessen Größe in Längsrichtung des Streifens im wesentlichen der halben Länge der Bodenwand entspricht, auf eine solche Weise, daß der Streifen, wenn er zusammengefoldet bzw. gefaltet ist, über die gesamte Länge der genannten Seitenwandplatte (13) des Behälters und über die halbe Länge der hierzu benachbarten Bodenwand eingelegt werden kann. 45
3. Verfahren nach Anspruch 2, worin die Auskleidung (1) aus mindestens zwei identischen, rechteckigen oder quadratischen Stocken (2, 3) aus flexiblem Bahnmaterial hergestellt ist, die miteinander an ihren Umfangskanten (23) zusammengeschweißt sind, wobei die eine Bahn mit Befestigungsmitteln zur Anordnung der Auskleidung bezüglich des Behälters versehen ist. 50
4. Verfahren nach Anspruch 3, worin die Befestigungsmittel bezüglich der Bodenwand des Behälters angeordnet werden, wobei die genannten Befestigungsmittel ein Entleerungsauslaß (5) der Auskleidung sind. 55
5. Verfahren nach Anspruch 4, worin die Stücke aus Bahnmaterial durch eine Zerteilungslinie bzw. Mittellinie in mindestens zwei gleiche quadratische Hälften unterteilt werden, die vier Eckteile (6) der Hälften jeweils zur Mitte der Stücke hin umgefaltet werden und die Teile, die zu den Seiten der Zerteilungslinie bzw. Mittellinie hin liegen, einmal oder mehrfach auf eine solche Weise umgefaltet oder aufgerollt sind, daß die Auskleidung einen Streifen bildet, der aus mehreren Schichten gebildet ist, die übereinanderliegen. 60
6. Verfahren nach Anspruch 5, worin die vier Eckteile (6) umgefaltet oder aufgerollt sind und mindestens einen schmalen Raum (7) zwischeneinander freilas-

- sen, in welchem Raum die Befestigungsmittel liegen.
7. Verfahren nach einem der vorangehenden Ansprüche, mit dem Schritt, ein Gebinde bzw. ein Paket vorzusehen, in dem die Auskleidung aufgenommen ist, wobei das genannte Gebinde bzw. ein Paket eine Anzahl von Platten (11, 13-17) aufweist, die im zusammengelegten Zustand die Auskleidung (1) umschließen und im auseinandergelegten Zustand eine Anzahl von Wänden und den Boden des Behälters abdecken. 5
 8. Verfahren nach Anspruch 7, worin das Gebinde eine Mittelplatte (11) umfaßt, deren Abmessungen dem Boden des Behälters entsprechen, sowie Seitenplatten (13, 14), die an zwei gegenüberliegenden Seiten bzw. Kanten des Bodens vorgesehen sind und deren Abmessungen denen zweier gegenüberliegender Wände des Behälters auf eine solche Weise entsprechen, daß die Seitenplatten (13, 14) gegen die genannten Wände hin aufgeschlagen werden können, wenn die Mittelplatte (11) auf dem Boden aufgesetzt ist, und worin die Auskleidung (1) an einer der Seitenplatten befestigt ist. 10 20 25
 9. Verfahren nach Anspruch 8, worin die Seitenplatten (13, 14) des Gebindes an beiden Seiten Zusatzplatten (15, 16) aufweisen, die gegen die beiden anderen Wände des Behälters aufgeschlagen werden können. 30

Revendications

1. Procédé de pliage d'une doublure en matière plastique souple pour former une bande allongée ayant une largeur qui est sensiblement plus petite que la largeur d'un panneau de paroi latérale d'un récipient en forme de bloc, de mise en place de ladite doublure repliée contre un panneau de paroi latérale dudit récipient pour qu'elle s'étende dans le sens de sa longueur au moins entre les parois de dessus et de dessous dudit récipient, et de dépliage de ladite doublure repliée en direction à la fois des panneaux de parois latérales adjacents et du panneau de paroi latérale opposée du récipient. 35 40 45
2. Procédé selon la revendication 1, dans lequel la bande se poursuit au-delà du bord supérieur du panneau de paroi latérale (13) ainsi que sur le panneau de dessous par une pièce dont la taille, dans le sens de la longueur de la bande, correspond sensiblement à la moitié de la longueur de la paroi de dessous, de telle sorte que lorsqu'elle est repliée la bande peut être placée sur toute la longueur dudit panneau de paroi latérale (13) du récipient et sur la moitié de la longueur de la paroi de dessous adjacente à celui-ci. 50 55
3. Procédé selon la revendication 2, dans lequel la doublure (1) est faite d'au moins deux pièces identiques (2, 3), rectangulaires ou carrées, d'un matériau en feuille souple qui sont soudées l'une à l'autre au niveau de leur bord périphérique (23), l'une des feuilles étant pourvue d'un moyen de fixation pour positionner la doublure par rapport au récipient.
4. Procédé selon la revendication 3, dans lequel le moyen de fixation est positionné par rapport à la paroi de dessous du récipient, ledit moyen de fixation étant une sortie d'évacuation (5) de la doublure.
5. Procédé selon la revendication 4, dans lequel les pièces du matériau en feuille sont divisées par une ligne bissectrice en au moins deux moitiés carrées égales, les quatre coins (6) des moitiés sont repliés chacun vers le centre des pièces et les parties situées sur les côtés de la ligne bissectrice sont repliées ou roulées une ou plusieurs fois, de sorte que la doublure forme une bande faite de plusieurs couches placées les unes sur les autres.
6. Procédé selon la revendication 5, dans lequel les quatre coins (6) sont repliés ou roulés en laissant libre au moins un étroit espace (7) entre eux, espace dans lequel est placé le moyen de fixation.
7. Procédé selon l'une des précédentes revendications, comprenant l'étape consistant à utiliser un boîtier dans lequel est logée la doublure, ledit boîtier comprenant un certain nombre de panneaux (11, 13-17) qui, en position repliée, entourent la doublure (1) et, en position déployée, recouvrent un certain nombre de parois et le dessous ou fond du récipient.
8. Procédé selon la revendication 7, dans lequel le boîtier comprend un panneau central (11) dont les dimensions correspondent au fond du récipient et des panneaux latéraux (13, 14) qui sont placés sur les deux bords opposés du fond et dont les dimensions correspondent à celles des parois opposées du récipient, de telle sorte que les panneaux latéraux (13, 14) peuvent être déployés sur lesdites parois lorsque le panneau central (11) est placé sur le fond, et la doublure (1) est fixée à l'un des panneaux latéraux.
9. Procédé selon la revendication 8, dans lequel les panneaux latéraux (13, 14) du boîtier comportent de chaque côté des panneaux auxiliaires (15, 16) qui peuvent être déployés sur les deux autres parois du récipient.

fig-1

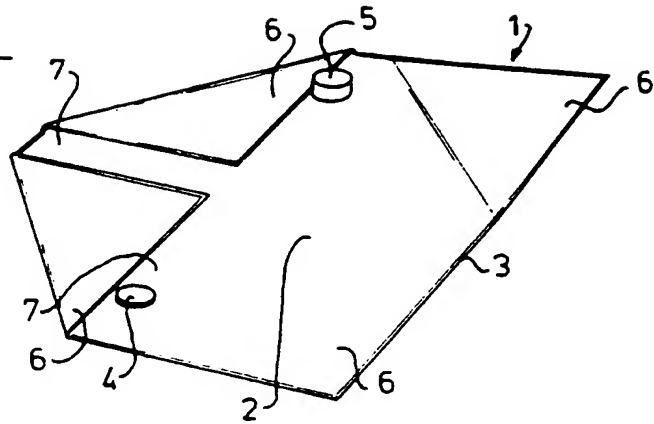


fig-2

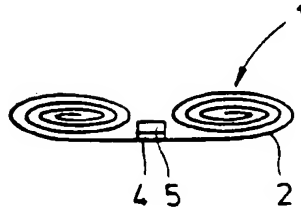


fig-3

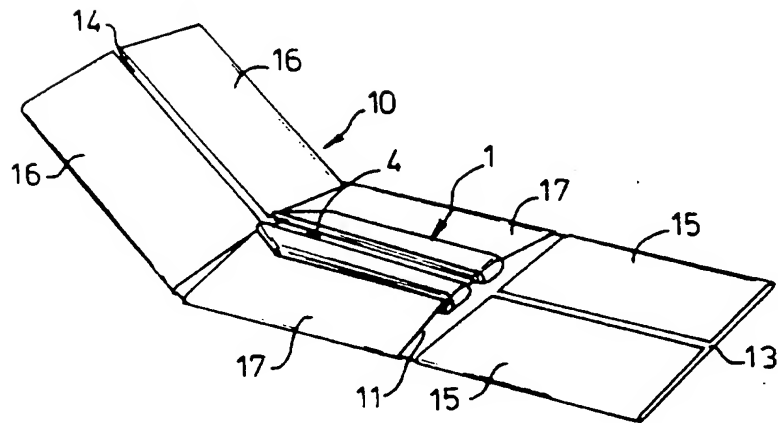


fig - 4

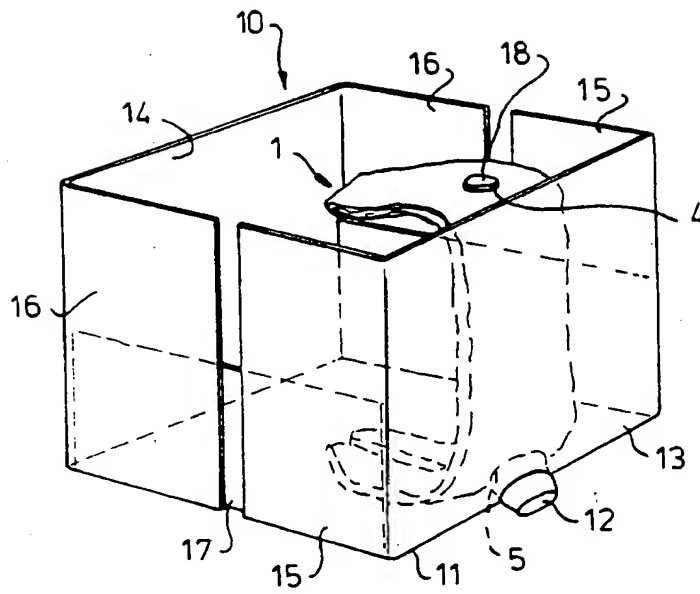


fig-5

